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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,985	06/20/2003	Kurt R. Carlson	NGC-139/000009-199	7136
32205	7590	10/20/2004	EXAMINER	
PATTI & BRILL ONE NORTH LASALLE STREET 44TH FLOOR CHICAGO, IL 60602			KALIVODA, CHRISTOPHER M	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/600,985

Applicant(s)

CARLSON ET AL.

Examiner

Christopher M. Kalivoda

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-32 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claim 26 is objected to because of the following informalities: There is a missing word "of" in line 4, just before the second word "layers". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 6-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cordova et al., U.S. Patent 5,546,482 in view of Rosenmayer et al., U.S. Patent 5,675,686. Regarding independent claims 1, 15, 17 and 31 as claimed, Cordova et al. teaches an apparatus and method comprising a polymeric potting material (abstract lines 1-3 and Fig 2, ref sign 16) that encapsulates a fiber optic sensing coil (abstract, lines 1-3 and col 3, lines 41-43, Fig 1, ref sign 10). The fibers are wound about a spool (Fig 2, ref sign 14) to form the fiber optic sensing coil (Fig 1, ref sign 10) that comprises

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a plurality of layers of the fiber optic cable (Fig 2). The polymeric potting material holds together the layers of the fiber optic sensing coil wound as a unit (col 4, lines 38-40).

However, the reference is silent with respect to the polymeric potting material comprising a plurality of voids wherein upon introduction of an applied force to a portion of the polymeric potting material, the voids compress to allow a portion of the polymeric material to absorb a portion of the applied force a promote a decrease of a reaction force from a portion of the polymeric potting material to the fiber optic sensing coil. It is also silent with respect to the plurality of voids compressing to decrease a strain on the fiber optic sensing coil wherein the decrease in strain on the fiber optic sensing coil promotes a decrease in a bias error of the fiber optic sensing coil.

Rosenmayer generally teaches a polymeric material comprising a plurality of voids (col 4, lines 12-16) wherein upon introduction of an applied force to a portion of the polymeric material, the voids compress to allow a portion of the polymeric material to absorb a portion of the applied force a promote a decrease of a reaction force from a portion of the polymeric material to a fiber. Furthermore, the strain on the fiber is reduced since the forces imparted to fiber are distributed (col 4, lines 23 - 43).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the polymeric potting material of Cordova et al. to have voids as taught by Rosenmayer et al. wherein upon introduction of an applied force to a portion of the polymeric potting material, the voids compress to allow a portion of the polymeric material to absorb a portion of the applied force a promote a decrease of a reaction force from a portion of the polymeric potting material to the fiber optic sensing

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coil. This would also decrease the strain on the fiber optic sensing coil and decrease bias errors.

The motivation is to protect the fibers from mechanical loads (col 4, lines 25-27).

Regarding claims 2 and 22, the compression of the voids promotes a decrease in the strain of the fiber optic sensing coil due to contact with the polymeric potting material since the structure as claimed is present.

Regarding claims 3 and 4, the plurality of voids promotes a decrease in the bulk modulus of the polymeric potting material since structure as claimed is present. Cordova et al. teach environmental effects can introduce error (col 1, lines 35-39) so upon a change in temperature, the voids promote a decrease in thermal pressure induced on the fiber optic sensing coil since the structure as claimed is present.

Regarding claims 6, 16, 18 and 21, Cordova et al. teaches a wound fiber optic sensing coil (col 3, lines 46-49) comprising a first coil portion and a second coil portion wherein a portion of the polymeric potting compound separates the first and second portions (Fig 2) and wherein a portion of the polymeric potting compound comprises one or more of a plurality of voids as described above. The plurality of voids compress to allow the portion of the polymeric potting material to absorb a portion of the applied force (as described above) from one or more of the first coil portion and second coil portion which also reduces pressure between the between the layers since the structure as claimed is present.

Regarding claims 7, 8 and 19, the voids compress to promote the decrease of the reaction force from the portion of the polymeric potting material to the first coil portion wherein the reaction force is generated in response to the applied force from the second coil portion or wherein the reaction force is generated in response to the applied force from the first coil portion since the structure as claimed is present.

Regarding claim 9, upon expansion of the fiber optic sensing coil, the first coil portion and second coil portion exert the applied force on the polymeric potting material, the voids compress to reduce the strain in the first coil portion and second coil portion since the structure as claimed is present.

Regarding claim 10, the first and second coil portions comprise adjacent layers of the fiber optic sensing coil and are separated by a distance (Cordova et al. Fig 2) and the diameter of the voids is smaller than that distance.

Regarding claim 11, the distribution of voids is uniform due to the symmetry of Figure 2 in Rosenmayer et al.

Regarding claim 12, Cordova et al. teach the fiber optic sensing coil is used in a fiber optic gyroscope (col 1, line 11) to sense a rate of rotation (col 1, lines 31-34).

Regarding claim 13, the compression of the voids promotes a decrease in a rotation sensing bias error of the fiber optic gyroscope through a promotion of a decrease in pressure exerted on the fiber optic sensing coil by the polymeric material since the claimed structure is present as described above.

Regarding claim 20, Cordova et al. teach the fiber optic sensing coil is used in a fiber optic gyroscope (col 1, line 11) to sense a rate of rotation (col 1, lines 31-34) and

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promoting a decrease in a rotation sensing bias error of the fiber optic gyroscope through a promotion of a decrease in pressure exerted on the fiber optic sensing coil by the polymeric potting material since the claimed structure is present as described above.

Regarding claims 26 and 27, the sensing coil comprises a plurality of layers of fiber optic cable wound about a spool (Cordova et al, col 3, lines 46-49 and Fig 2). The polymeric potting material holds together the plurality of layers of the sensing coil as a wound unit (col 4, lines 38-40). In addition, the polymeric potting material holds a position of a first layer of the plurality of layers relative to an adjacent layer of the plurality of layers in the wound unit (col 4, lines 38-43 and Fig 2). The voids promote compressibility of the polymeric potting material that holds the position of the first layer relative to the adjacent layer as described above.

Regarding claims 14, 23, 23-25, 28-30 and 32, the use of hollow elastomeric microspheres is well known as evidenced in U.S. Patent 5,869,164. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to replace the voids with microballoons since they can undergo instantaneous compression and rebound for impact padding uses (col 5, lines 25-28).

Conclusion

Any inquiry concerning this communication or earlier communications from the

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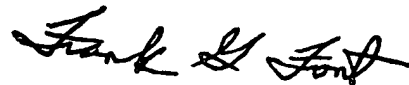
examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


cmk



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